DOCUMENT RESUME

ED 295 988 TM 011 838

AUTHOR Brooks, Margaret G.
TITLE An Analysis of Variables for Predicting the Student Achievement of the Atlanta Public Schools.
INSTITUTION Atlanta Public Schools, GA. Div. of Curriculum and Research Services.
PUB DATE Apr 88
NOTE 22p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 5-9, 1988).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Achievement Tests; Elementary School Students; High School Students; Junior High School Students; Mathematics Achievement; Predictive Validity; *Predictor Variables; Reading Achievement; *Socioeconomic Status
IDENTIFIERS *Atlanta Public Schools GA; Georgia Criterion Referenced Tests; *Iowa Tests of Basic Skills

ABSTRACT

Stepwise regression was used in 1986 and 1987 to determine the best predictor variables for predicting the percentage of students in the 113 Atlanta Public Schools scoring at or above the national norm in reading and mathematics on the Iowa Tests of Basic Skills/Tests of Achievement and Proficiency. Twenty elementary school, 16 middle school, and 16 high school variables were identified. While socioeconomic status was the best predictor for elementary school students in 1986, the grade 1 mean scale score on the Georgia Criterion-Referenced Tests (GCRT) was the best predictor for elementary students in 1987. In middle school, the GCRT score of grade 8 was the best predictor in 1986, with socioeconomic status the best predictor for 1987. Socioeconomic status was the best predictor for high school students for both years in reading and for mathematics in 1987. The percentage passing the GCRT was the best predictor for mathematics in 1986. Although socioeconomic status is not a good predictor of individual achievement, it is a strong predictor of school achievement levels. Seven tables present test data. (SLD)

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An Analysis of Variables for Predicting the Student Achievement of the Atlanta Public Schools

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Prepared by

Margaret G. Brooks

Division of Curriculum and Research Services
Department of Research and Evaluation
Atlanta Public Schools

Paper presented at the annual meeting of the
American Educational Research Association
New Orleans, Louisiana

April 1988

TM 011 838

AN ANALYSIS OF VARIABLES FOR PREDICTING THE STUDENT ACHIEVEMENT OF THE ATLANTA PUBLIC SCHOOLS

ABSTRACT

In 1986, school variables which would serve as possible predictors of the percentage of students scoring at or above the national norm in reading and mathematics on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency* (ITBS/TAP) were identified for the elementary, middle, and high schools of the Atlanta Public Schools. Stepwise regression analysis was used in 1986 to determine the best predictor variables. The analysis was repeated in 1987.

Of the 20 elementary school variables identified in 1986 as possible predictors of the percentage of elementary students scoring at or above the national norm on the *Iowa Tests of Basic Skills* reading, the socioeconomic status (SES) variable was the best predictor. When the stepwise regression analyses were repeated for the elementary schools using 1987 ITBS data, the SES variable was no longer identified as a predictor variable for elementary school achievement on the ITBS. The Grade 1 *Georgia Criterion-Referenced Tests* (GCRT) mean scale score was the best predictor variable. The Grade 1 GCRT in reading accompanied by the Grade 3 GCRT mean scale score in reading and the percentage of kindergarten pupils scoring above the national norm on the *California Achievement Tests* prereading were the strongest variables for predicting the percentage of elementary school students scoring at or above the national norm on both reading and mathematics of the ITBS.

Of the 16 middle school variables identified, the Grade 8 GCRT mean scale score in reading was the best predictor of the percentage of students scoring at or above the national norm on the ITBS reading and mathematics in 1986. In 1987, the SES variable emerged as the best predictor of middle school achievement levels in both reading and mathematics.

There were 16 school variables identified for the high schools. The SES variable was the best predictor of the percentage of students scoring at or above the national norm in reading on the ITBS/TAP in 1986. The percentage of students passing the *Georgia Basic Skills Tests* (GBST) in mathematics the first time tested contributed toward explaining the variance in the percentage of high school students scoring at or above the national norm in reading on the ITBS/TAP and was the best variable for predicting the percentage of high school students scoring at or above the national norm on the ITBS/TAP mathematics.

In 1987, the SES variable was the best of predictor of the percentage of high school students scoring at or above the national norm on the ITBS/TAP reading and mathematics.

AN ANALYSIS OF VARIABLES FOR PREDICTING THE STUDENT ACHIEVEMENT OF THE ATLANTA PUBLIC SCHOOLS

INTRODUCTION

In the current climate of accountability in public school education, there is increased national emphasis on testing. Students in kindergarten through grade 12 are being administered both norm-referenced and criterion-referenced tests to evaluate individual student, school, and school system achievement levels.

In Georgia, as a result of the Georgia Quality Basic Education Act, the testing of public school students is required for promotion from third to fourth grade and for high school graduation. This spring, for the first time, group testing of Georgia kindergarten pupils will be required in determining readiness for public school first grade.

In addition to the minimum competency testing for promotion and high school graduation and other criterion-referenced testing, norm-referenced achievement testing of public school students in Georgia is required. The new emphasis on the test performance of students throughout the state and the availability of comparison scores has resulted in the rankings of school systems and schools within systems on the basis of test performance alone.

There is a need to identify and analyze school variables which may serve as predictors of student achievement and, thereby, help to explain the variance in test scores among schools.

A review of the literature indicates that numerous studies have made use of the socioeconomic status (SES) of the family as a predictor of school achievement. A meta-analysis of the relationships between SES and academic achievement concluded that SES and academic achievement are weakly correlated for individual students but strongly correlated for aggregated data such as schools (White, 1982). School differences in student body SES were found important because they are associated with differences in value climate (sometimes identified as environmental press), influence aggregated status levels for quality and character of peer networks, and affect the school's pattern of curriculum enrollment (Fennessey, McDill, Alexander, D'Amico, 1979). Also, the preliminary findings of the recent Milwaukee area study of schools indicate a strong relationship between academic achievement and SES (Walsh, 1986).

The controversy regarding the relationship of class size and student achievement continues with studies making a case for smaller class size (Glass and Down, 1979 and Schiever, 1979) and other studies reporting that the data do not support smaller class size (Simpson, 1980).

Background

In 1980, only one-third of the Atlanta Public Schools' students in grades 1 through 8 scored at or above the national norm on the 1978 edition of the *California Achievement Tests*. As a result, a goal was established which stated that by 1985, at least 50 percent of all students in the Atlanta Public Schools would score at or above the national norm in reading and mathematics. The *California Achievement Tests* were administered each spring during the five-year period in order to determine the annual progress toward meeting the goal. In 1985, 56 percent of the kindergarten through grade 12 students scored at or above the national norm in reading, and 63 percent scored at or above the national norm in mathematics. The 1985 goal was exceeded.

From 1980 to 1985, there was no ranking of schools within the Atlanta Public Schools based on norm-referenced achievement test scores. Rather, achievement levels for each school were reviewed in terms of progress toward meeting the systemwide goal.

Although criterion-referenced testing at certain grade levels was required by the Georgia Department of Education prior to 1985, the norm-referenced achievement testing was determined locally based on the identified local needs and goals.

The Atlanta Public Schools testing program for the 1985-86 school year was planned in the spring of 1985. However, during the summer of 1985, the Georgia Department of Education added norm-referenced testing as an annual requirement for public school students in grades 2, 4, 7, and 9. In order to avoid duplicate testing and, at the same time maintain a process for determining annual progress of students, the local plans were changed, and the tests selected for use at the state-required grade levels were used locally for the remaining grade levels (grades 1, 3, 5, 6, 8, 10 and 11).

Although kindergarten through grade 12 had been administered the same norm-referenced achievement tests in 1985, grades 1 through 11 only were included for the spring of 1986. A different norm-referenced achievement test was state-required for kindergarten pupils, and students at grade 12 were excluded since spring test scores for graduating seniors were felt to be of limited instructional benefit.

Table 1 includes the tests administered to Atlanta Public Schools students in the 1985-86 and 1986-87 school years.

Table 1

TESTING PROGRAM FOR THE ATLANTA PUBLIC SCHOOLS IN THE 1985-86 AND 1986-87 SCHOOL YEARS

A. Tests Required by Georgia Quality Basic Education Act

1. *Georgia Criterion-Referenced Tests* (GCRT) in reading and mathematics at grades 1, 3, 6, and 8. The GCRT for grade 3 has been used as a test to determine promotion to grade 4 since the 1985-86 school year.

2. *Georgia Criterion-Referenced Tests* (GCRT) in writing at grades 6 and 8. The tests were administered for the first time in the spring of 1987.

3. *Georgia Basic Skills Tests* (GBST) in reading and mathematics administered in the fall and the spring. Used as a requirement for public high school graduation with a diploma.

4. *Georgia Basic Skills Tests* (GBST) in writing. Fall 1987 tenth graders were the first group required to achieve a passing score as a requirement for graduation with a diploma.

5. *California Achievement Tests*, Form E, for kindergarten pupils. The test has been administered since the spring of 1986, but it will be used in determining first grade readiness beginning with the fall of 1988.

6. *Iowa Tests of Basic Skills*, Form G, administered at Grades 2, 4, and 7 in the spring.

7. *Tests of Achievement and Proficiency*, Form G, administered at grade 9 in the spring.

B. Tests Required Locally

1. *Iowa Tests of Basic Skills*, Form G, administered at Grades 1, 3, 5, 6, and 8 in the spring.

2. *Tests of Achievement and Proficiency*, Form G, administered at grades 10 and 11 in the spring.

Along with concern for the changes in the Atlanta Public Schools Testing Program and the volume of testing required as a result of the Georgia Quality Basic Education Act, there were concerns regarding instruction. Was the curriculum preparing students for the various tests? Should instruction focus on the objectives of the criterion-referenced tests or the norm-referenced tests?

The most frequently asked question after the release of the 1986 test results was why the 1986 norm-referenced achievement test scores were lower than the 1985 scores? After a five-year period of placing emphasis on annual reading and mathematics gains based on a norm-referenced achievement test, it was difficult to explain why the 1985 spring scores based on the 1978 edition of a test should not be compared with 1986 spring scores based on the 1985 edition of a different test.

For those who agreed that 1985 and 1986 test scores should not be compared, there was the tendency to rank schools on the basis of the 1986 test scores alone.

Objective

The objective was to identify school variables within the categories of elementary, middle, and high schools which could serve to predict the school achievement in reading and mathematics on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency* and, thereby, help to explain the variance in test scores among schools.

METHODS

Sample

During the 1985-86 and 1986-87 school years, the Atlanta Public Schools consisted of 83 elementary schools, 10 middle schools, and 20 high schools. All schools were included.

School Variables

In the process of selecting school variables which could be used to predict the percentage of pupils at each school scoring at or above the national norm in reading and mathematics on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency*, two criteria were used: (1) the variable had to be quantifiable and (2) the variable existed for each of the schools within the categories of elementary, middle, and high schools.

The following elementary school variables were identified in 1986:

1. Number of students attending the school (active roll).

2. Percentage of students receiving compensatory reading instruction funded by Chapter I.

3. Percentage of students receiving compensatory mathematics instruction funded by Chapter I.

4. Teacher/pupil ratio.

5. Percentage of students transferring to the school from another school system.

6. Percentage of students transferring to the school from another school within the Atlanta Public Schools.

7. Pupil mobility rate.

8. Percent of attendance for students.

9. Percent of attendance for certified staff.

10. Percentage of students receiving free or reduced-price school lunches.

11. A change in principal from 1981 to 1986. (Indicated by 1 or 0 to indicate yes or no, respectively.)

12. *Georgia Criterion-Referenced Tests* (GCRT) mean scale scores.

    a. Grade 1 reading
    b. Grade 1 mathematics
    c. Grade 3 reading
    d. Grade 3 mathematics

13. Percentage of pupils who were administratively placed. (The students fulfilled most but not all requirements for promotion, but were placed at the next grade level.)

14. Percentage of pupils retained at the same grade level.

15. Percentage of kindergarten pupils with less than 6 months preschool/daycare experience.

16. Percentage of first grade pupils who did not attend kindergarten. (Full-day kindergarten is provided but is not compulsory.)

17. Percentage of students completing the expected number of Houghton-Mifflin basal reading magazines during the year.

18. Percentage of students completing the expected number of Houghton-Mifflin basal mathematics chapters during the year.

19. Percentage of kindergarten pupils completing *Getting Ready to Read*, the readiness book for the Houghton-Mifflin reading basal series.

20. Percentage of kindergarten pupils scoring above the national norm on the *California Achievement Tests*.

    a) prereading
    b) mathematics

Sixteen school variables were identified in 1986 for the middle schools. Fifteen of the 16 were the same variables identified at the elementary level and the remaining variable involved middle school grades only. The 16 middle school variables were as follows:

1. Number of students attending the school (active roll).

2. Percentage of students participating in compensatory reading classes funded by Chapter I.

3. Percentage of students participating in compensatory mathematics classes funded by Chapter I.

4. Teacher/pupil ratio.

5. Percentage of pupils transferring to the school from another school system.

6. Percentage of pupils transferring to the school from another school within the Atlanta Public School System.

7. Pupil mobility rate.

8. Percent of attendance for pupils.

9. Percent of attendance for certified staff.

10. Percentage of students receiving free or reduced-price school lunches.

11. A change in principal from 1981 to 1986.

12. *Georgia Criterion-Referenced Tests* mean scale scores.

    a) Grade 6 reading
    b) Grade 6 mathematics
    c) Grade 8 reading
    d) Grade 8 mathematics

13. Percentage of students administratively placed. (Students who had not completed all requirements for progression but were placed at the next grade level.)

14. Percentage of students retained at the same grade level.

15. Percentage of pupils completing the expected number of reading basal magazines.

16. Percentage of students completing the expected number of mathematics basal chapters.

Sixteen high school variables were identified in 1986. Eleven of the 16 variables were the same variables identified for the elementary and middle school levels. The remaining 5 variables were unique to high school. The 16 high school variables were as follows:

1. The number of students attending the school (active roll).

2. The percentage of students participating in compensatory or remedial reading classes funded by Chapter I, Chapter II, or Georgia (CEP/REP).

3. Percentage of students participating in compensatory or remedial mathematics classes funded by Chapter I, Chapter II, or Georgia (CEP/REP).

4. Teacher/pupil ratio.

5. Percentage of students transferring to the school from another school system.

6. Percentage of students transferring to the school from another school within the school system.

7. Pupil mobility rate.

8. Percent of attendance for students.

9. Percent of attendance for certified staff.

10. Percentage of students receiving free or reduced-price school lunches.

11. A change in principal from 1981 to 1986.

12. Percentage of students passing the *Georgia Basic Skills Tests* (GBST) in reading the first time tested.

13. Percentage of students passing the GBST in mathematics the first time tested.

14. Percentage of students participating in a Magnet program.

15. Percentage of students mastering the expected materials in the standardized language arts classes. (The content of language arts courses has been standardized across the high schools.)

16. Percentage of students mastering the expected materials in the standardized mathematics classes. (The content of mathematics courses and the tests for the courses have been standardized across the high schools.)

Analysis of Data

Stepwise regression analysis was used in 1986 for six cases. They were as follows:

Case	Dependent Variable	Independent Variables
1	The percentage of elementary school pupils scoring at or above the national norm on the *Iowa Tests of Basic Skills* (ITBS) reading in 1986.	The 20 identified elementary school variables
2	The percentage of elementary school pupils scoring at or above the national norm on the ITBS mathematics in 1986.	The 20 identified elementary school variables.
3	The percentage of middle school pupils scoring at or above the national norm on the ITBS reading in 1986.	The 16 identified middle school variables.
4	The percentage of middle school students scoring at or above the national norm on the ITBS reading in 1986.	The 16 identified middle school variables.
5	The percentage of high school students scoring at or above the national norm on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency* (ITBS/TAP) reading in 1986.	The 16 identified high school variables.
6	The percentage of high school students scoring at or above the national norm on the ITBS/TAP mathematics in 1986.	The 16 identified high school variables.

Stepwise regression analysis was used again in 1987. The six cases were repeated using 1987 ITBS/TAP data for the schools. However, the total number of elementary, middle, and high school variables was reduced based on the findings of 1986. The correlation matrices of the 1986 stepwise regression analyses were reviewed and only those school variables which correlated significantly ($p \leq .05$) with the dependent variables were included in the 1987 analyses.

At the elementary level, the following independent variables were not correlated significantly ($p \leq .05$) with the percentage of students scoring at or above the national norm in either reading or mathematics and were dropped from the 1987 analyses:

1. The number of students attending the school (active roll).
2. Teacher/pupil ratio.
3. Percentage of students transferring from another school system.
4. Percent of attendance for students.
5. Percent of attendance for certified staff.
6. A change in principal from 1981 to 1986.

At the middle school level, 9 of the independent variables used in 1986 did not correlate significantly ($p \leq .05$) with the percentage of students scoring at or above the national norm in reading or mathematics on the *Iowa Tests of Basic Skills*. Those dropped for the 1987 stepwise regression analyses for middle schools were as follows:

1. Teacher/Pupil ratio.
2. Percentage of students transferring from another school system.
3. Percentage of students transferring from another school within the school system.
4. Pupil mobility rate.
5. Percent of attendance for students.
6. Percent of attendance for certified staff.
7. A change in principal from 1981 to 1986.
8. Percentage of students administratively placed at the next grade level.
9. Percentage of students retained at the same grade level.

At the high school level, 6 independent variables which did not correlate significantly ($p \leq .05$) with the dependent variables in 1986 were excluded from the 1987 stepwide regression analyses for high schools. They were as follows:

1. Teacher/Pupil ratio.
2. Percentage of students transferring from another school system.
3. Pupil mobility rate.
4. Percent of attendance for certified staff.
5. A change in principal from 1981 to 1986.
6. Percentage of students mastering the expected materials in standardized language arts classes.

RESULTS

Elementary Schools

In 1986, the stepwise regression analysis, reported in Table 2, indicated 2 variables which could be used to predict the percentage of elementary pupils scoring at or above the national norm in reading on the *Iowa Tests of Basic Skills* (ITBS). They were (1) the percentage of students receiving free or reduced-price school lunches and (2) the Grade 1 *Georgia Criterion-Referenced Tests* (GCRT) mean scale score in reading. With the 2 variables, 68 percent of the variance in the percentage of pupils scoring at or above the national norm was explained.

In 1986, 3 variables explained 63 percent of the variance in the percentage of elementary pupils scoring at or above the national norm on the mathematics of the ITBS. They were (1) Grade 1 GCRT mean scale score in reading, (2) the percentage of pupils receiving free and reduced-price school lunches, and (3) Grade 3 GCRT mean scale score in mathematics.

Table 2

STEPWISE REGRESSION ANALYSIS OF THE ELEMENTARY SCHOOL VARIABLES, 1986

I. Dependent variable: Percentage of elementary pupils scoring at or above the national norm on the *Iowa Tests of Basic Skills* (ITBS) reading

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of pupils receiving free and reduced-price school lunches	.7676	.5892	.5892
2	Grade 1 *Georgia Criterion-Referenced Tests* (GCRT) mean scale score in reading	.8225	.6765	.0874

II. Dependent variable: Percentage of elementary pupils scoring at or above the national norm on the ITBS mathematics

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Grade 1 GCRT mean scale score in reading	.7099	.5040	.5040
2	Percentage of pupils receiving free and reduced-price school lunches	.7675	.5891	.0851
3	Grade 3 GCRT mean scale score in mathematics	.7938	.6300	.0409

In repeating the analysis in 1987, 5 variables explained 63 percent of the variance in the percentage of elementary pupils scoring at or above the national norm in reading on the ITBS. Reported in Table 3, they are: (1) Grade 1 GCRT mean scale score in reading, (2) Grade 3 GCRT mean scale score in reading, (3) the percentage of kindergarten pupils scoring above the national norm on the *California Achievement Tests* (CAT) prereading, (4) the percentage of first graders who did not attend kindergarten, and (5) the percentage of kindergarten pupils completing *Getting Reading to Read*.

Table 3

STEPWISE REGRESSION ANALYSIS OF THE ELEMENTARY SCHOOL VARIABLES – 1987

I. Dependent variable: Percentage of elementary pupils scoring at or above the national norm on the *Iowa Tests of Basic Skills* (ITBS) reading

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Grade 1 *Georgia Criterion-Referenced Tests* (GCRT) mean scale score in reading	.6355	.4038	.4038
2	Grade 3 GCRT mean scale score in reading	.7244	.5247	.1209
3	The percentage of kindergarten pupils scoring above the national norm on the *California Achievement Tests* (CAT) prereading	.7614	.5798	.0551
4	The percentage of first graders who did not attend kindergarten	.7821	.6117	.0319
5	The percentage of kindergarten pupils completing *Getting Ready to Read*	.7956	.6329	.0212

II. Dependent variable: Percentage of elementary pupils scoring at or above the national norm on the ITBS mathematics

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Grade 1 GCRT mean scale score in reading	.6681	.4463	.4463
2	Grade 3 GCRT mean scale score in reading	.7434	.5529	.1063
3	The percentage of kindergarten pupils scoring above the national norm on the CAT prereading	.7708	.5941	.0415
4	Percentage of pupils administratively placed at the next grade level	.7836	.6140	.0199
5	Percentage of pupils completing the expected mathematics basal chapters	.8004	.6406	.0266

In 1987, 5 variables accounted for 64 percent of the variance in the percentage of elementary students scoring at or above the national norm on the ITBS mathematics. They were (1) Grade 1 GCRT mean scale score in reading, (2) Grade 3 GCRT mean scale score in reading, (3) the percentage of kindergarten pupils scoring at or above the national norm on the prereading of the *California Achievement Tests*, (4) the percentage of pupils administratively placed at the next grade level, and (5) the percentage of pupils completing the expected mathematics basal chapters.

Middle Schools

As indicated in Table 4, 98 percent of the variance in the percentage of middle school students scoring at or above the national norm on the *Iowa Tests of Basic Skills* reading in 1986 was explained by 2 variables: (1) Grade 8 *Georgia Criterion-Referenced Tests* mean scale score in reading and (2) the percentage of pupils participating in Chapter I mathematics. Also in 1986, the Grade 8 GCRT mean scale score in reading explained 93 percent of the variance in the percentage of students scoring at or above the national norm on the ITBS mathematics.

Table 4

STEPWISE REGRESSION ANALYSIS OF THE MIDDLE SCHOOL VARIABLES – 1986

I. Dependent variable: Percentage of middle school pupils scoring at or above the national norm on the *Iowa Tests of Basic Skills* (ITBS) reading

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Grade 8 *Georgia Criterion-Referenced Tests* (GCRT) mean scale score in reading	.9776	.9556	.9556
2	Percentage of pupils participating in Chapter I math	.9886	.9773	.0217

II. Dependent variable: Percentage of middle school pupils scoring at or above the national norm on the ITBS mathematics

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Grade 8 GCRT mean scale score in reading	.9637	.9288	.9288

In repeating the stepwise regression analyses for the middle schools in 1987, as indicated in Table 5, one variable, the percentage of students receiving free or reduced-price school lunches, explained 89 percent of the variance in the percentage of middle school students scoring at or above the national norm on the ITBS reading. Two variables, the percentage of students receiving free or reduced-price school lunches and the Grade 8 mean scale score in reading, explained 99 percent of the variance in the

percentage of middle school students scoring at or above the national norm on the ITBS mathematics.

Table 5

STEPWISE REGRESSION ANALYSIS OF THE MIDDLE SCHOOL VARIABLES – 1987

I. Dependent variable: Percentage of middle school pupils scoring at or above the national norm on the *Iowa Tests of Basic Skills* (ITBS) reading

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of pupils receiving free and reduced-price school lunches	.9457	.8943	.8943

II. Dependent variable: Percentage of middle school pupils scoring at or above the national norm on the ITBS mathematics

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of pupils receiving free and reduced-price school lunches	.9804	.9612	.9612
2	Grade 8 *Georgia Criterion-Referenced Tests* (GCRT) in reading	.9938	.9877	.0265

High Schools

In 1986, stepwise regression analysis indicated 3 variables, identified in Table 6, which explained 92 percent of the variance in the percentage of high school students scoring at or above the national norm on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency* (ITBS/TAP) in reading. They were (1) the percentage of students receiving free or reduced-price school lunches; (2) the percentage of students passing the *Georgia Basic Skills Tests* (GBST) in mathematics the first time tested; and (3) the percentage of students participating in compensatory mathematics funded by Chapter I, Chapter II, or Georgia.

With the 1986 stepwise regression analysis using the percentage of high school students scoring at or above the national norm on the ITBS/TAP mathematics as the dependent variable, 3 independent variables accounted for 91 percent of the variance. They were (1) the percentage of students passing the *Georgia Basic Skills Tests* in mathematics the first time taken,

(2) the percentage of students participating in Magnet programs, and (3) a change of principal during the periods 1981 to 1986.

Table 6

STEPWISE REGRESSION ANALYSIS OF THE HIGH SCHOOL VARIABLES – 1986

I. Dependent variable: Percentage of high school students scoring at or above the national norm on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency* (ITBS/TAP) reading

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of students receiving free or reduced-price school lunches	.8916	.7949	.7949
2	Percentage of students passing the *Georgia Basic Skills Tests* (GBST) math the first time taken	.9484	.8995	.1045
3	Percentage of students participating in Chapter I, II, or CEP (Compensatory Education Program) mathematics	.9617	.9248	.0253

II. Dependent variable: Percentage of high school students scoring at or above the national norm on the ITBS mathematics

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of students passing the GBST math the first time tested	.8766	.7683	.7683
2	Percentage of students participating in Magnet programs	.9333	.8710	.1026
3	Change in principal from 1981 to 1986	.9536	.9093	.0383

Table 7

STEPWISE REGRESSION ANALYSIS OF THE HIGH SCHOOL VARIABLES – 1987

I. Dependent variable: Percentage of high school students scoring at or above the national norm on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency* (ITBS/TAP) reading

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of students receiving free and reduced-price school lunches	.8758	.7670	.7670
2	Percentage of students transferring from another school within the school system	.9206	.8474	.0804

II. Dependent variable: Percentage of high school students scoring at or above the national norm on the ITBS/TAP mathematics

Step	Independent Variables	Multiple R	R Square	Change in R Square
1	Percentage of students receiving free and reduced-price school lunches	.8102	.6564	.6564
2	Percentage of students passing the the *Georgia Basic Skills Tests* in mathematics the first time tested	.8849	.7831	.1267

In repeating the stepwise regression analysis in 1987, reported in Table 7, only 2 variables explained 85 percent of the variance. The variables were (1) the percentage of students receiving free and reduced-price school lunches and (2) the percentage of students transferring from another school within the school system.

In the repeated stepwide regression analysis using the percentage of high school students scoring at or above the national norm on the ITBS/TAP mathematics in 1987 as the dependent variable, 2 independent variables accounted for 78 percent of the variance. They were (1) the percentage of students receiving free or reduced-price school lunches and (2) the percentage of students passing the *Georgia Basic Skills Tests* in mathematics the first time tested.

DISCUSSION

The *Iowa Tests of Basic Skills*, Form G, and the *Tests of Achievement and Proficiency*, Form G, were administered in the Atlanta Public Schools for the first time in the spring of 1986. Because the tests were published in 1985, all support materials were not available at the beginning of the 1985-86 school year. By the 1986-87 school year, the test objectives had been matched with the objectives of the Atlanta Public Schools curriculum, and copies had been provided to the schools. Emphasis had been placed on teaching the test objectives through the classroom instruction. In the spring of 1987, the second year the ITBS/TAP were administered, there were improved test scores throughout the system.

Of the 20 elementary school variables identified in 1986 as possible predictors of the percentage of elementary students scoring at or above the national norm on the *Iowa Tests of Basic Skills* (ITBS) reading in 1986, the socioeconomic status (SES) variable was the best predictor and explained 59 percent of the variance in ITBS performance. The SES variable combined with the Grade 1 *Georgia Criterion-Referenced Tests* (GCRT) mean scale score in reading explained 68 percent of the variance. Then, the same two variables and a third variable, the Grade 3 GCRT mean scale score in mathematics, explained 63 percent of the variance in the percentage of elementary school students scoring at or above the national norm on the ITBS mathematics in 1986.

When the stepwise regression analyses were repeated for the elementary schools using 1987 ITBS data, the SES variable was no longer identified as a predictor variable for elementary school achievement on the ITBS. The Grade 1 GCRT mean scale score was the best predictor variable. The Grade 1 GCRT in reading accompanied by the Grade 3 GCRT mean scale score in reading and the percentage of kindergarten pupils scoring above the national norm on the *California Achievement Tests* (CAT) prereading were the strongest variables for predicting the percentage of elementary school students scoring at or above the national norm on both reading and mathematics of the ITBS.

At the middle school level, the Grade 8 GCRT mean scale score in reading was the best predictor of the percentage of students scoring at or above the national norm on the ITBS reading and mathematics in 1986. In 1987, the SES variable emerged as the best predictor of middle school achievement levels.

Among the high schools, the SES variable was the best predictor of the percentage of students scoring at or above the national norm in reading on the ITBS/TAP in 1986. The percentage of students passing the *Georgia Basic Skills Tests* (GBST) in mathematics the first time tested contributed toward explaining the variance in the percentage of high school students scoring at or above the national norm in reading on the ITBS/TAP and was

the best variable for predicting the percentage of high school students scoring at or above the national norm on the ITBS/TAP mathematics.

In 1987, the SES variable was the best of predictor of the percentage of high school students scoring at or above the national norm on the ITBS/TAP reading and mathematics. The percentage of high school students transferring to the school from another high school in the system contributed toward explaining the variance in the percentage of high school students scoring at or above the national norm in reading on the ITBS/TAP, and the percentage of students passing the GBST in mathematics the first time tested contributed toward explaining the variance in the percentage of high school students scoring at or above the national norm in mathematics on the ITBS/TAP.

IMPLICATIONS

After the second year of administering the *Iowa Tests of Basic Skills* in the elementary schools of the Atlanta Public Schools, reading performance of pupils in grades 1, 3, and the kindergarten on other state-required tests became stronger predictors of elementary school reading and mathematics achievement on the ITBS than the socioeconomic status (SES) variable. For Atlanta Public Schools staff members who saw little relationship between a criterion-referenced test with limited objectives and a standardized norm-referenced test with many objectives, the results of the regression analysis were important. The criterion-referenced test reading performance in grades 1 and 3 with the kindergarten prereading performance on the *California Achievement Tests* (CAT) can be used to predict the elementary school ITBS achievement in both reading and mathematics.

In 1987, the SES variable was the best predictor of both middle and high school achievement on the *Iowa Tests of Basic Skills/Tests of Achievement and Proficiency*. While the SES levels of individual students cannot be changed, the school SES variable can be adjusted by the busing of students across school zones or by the changing of school zone boundaries.

Although SES is not a good predictor of individual achievement, it continues to be a strong predictor of school achievement levels. This fact should be recognized and efforts made to provide additional academic support for schools with a high concentration of students from low SES families.

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